

WHAT IS CLAIMED IS:

1 1. An apparatus for entering and exiting a spacesuit in a
2 spacecraft, said spacesuit (1) having a spacesuit, entrance
3 and exit opening (2) in a back portion of said spacesuit,
4 said apparatus comprising a backpack (3) for opening and
5 closing said opening (2) of said spacesuit, said apparatus
6 comprising:

7 (a) a first sealing and interlocking subsystem (4)
8 operatively interposed between said spacesuit (1) and
9 a bulkhead (5') in said spacecraft (S) for connecting
10 said spacesuit (1) to said bulkhead (5) in an
11 interlocking force transmitting fit,

12 (b) a second sealing and interlocking subsystem (6)
13 operatively interposed between said backpack (3) and
14 said back portion of said spacesuit (1) around said
15 opening (2) for connecting said backpack (3) to said
16 spacesuit (1) in an interlocking and force
17 transmitting fit,

18 (c) a laterally flappable decontamination chamber (7) into
19 which said backpack (3) fits,

20 (d) a third sealing and interlocking subsystem (9)
21 operatively interposed between said spacesuit (1) or
22 backpack (3) and said decontamination chamber (7) for
23 connecting said spacesuit to said decontamination
24 chamber (7) in an isolating manner, and

25 (e) a fourth sealing and interlocking subsystem (12)
26 operatively interposed between said at least one
27 decontamination chamber (7) and said bulkhead (5') in

28 said spacecraft for connecting said decontamination
29 chamber (7) to said bulkhead (5') in an isolating
30 manner.

1 **2.** The apparatus of claim 1, wherein said first sealing and
2 interlocking subsystem (4) is arranged radially outwardly
3 of said entrance and exiting opening (2) and wherein said
4 second sealing and interlocking subsystem (6) is arranged
5 radially inwardly of said first sealing and locking
6 subsystem.

1 **3.** The apparatus of claim 1, wherein said laterally flappable
2 decontamination chamber comprises an open side surrounded
3 by a chamber flange (7A), and wherein said third sealing
4 and locking subsystem (9) is arranged radially inwardly of
5 said chamber flange (7A) for connecting said backpack (3)
6 of said spacesuit to said decontamination chamber (7) with
7 an interlocking, force transmitting fit.

1 **4.** The apparatus of claim 3, wherein said fourth sealing and
2 locking subsystem (12) is arranged radially outwardly of
3 said chamber flange (7A) for connecting said
4 decontamination chamber (7) to said bulkhead (5') with an
5 interlocking force transmitting fit.

1 **5.** The apparatus of claim 1, further comprising a hinge (H)
2 between said bulkhead (5') and said decontamination chamber
3 (7) for opening and closing a hole (5A) in said bulkhead

(5') by laterally flapping said decontamination chamber into an open position or back into a closed position.

6. The apparatus of claim 5, further comprising a docking flange (10) framing said hole (5A) in said bulkhead (5').

7. The apparatus of claim 6, wherein said first sealing and locking subsystem (4) surrounds said docking flange (10) radially outwardly of said docking flange (10).

8. The apparatus of claim 6, wherein said second sealing and locking subsystem (6) is positioned radially inwardly of said docking flange (10).

9. The apparatus of claim 6, wherein said docking flange (10) comprises a ring portion (10A), a radially outwardly extending flange portion connected to said ring portion (10A) and facing said spacesuit (1), and a radially inwardly extending flange portion connected to said ring portion and facing said backpack (3).

10. The apparatus of claim 6, further comprising a seal (S) between said docking flange (10) and a rim of said hole (5A) in said bulkhead (5').

11. The apparatus of claim 1, wherein said bulkhead (5') separates a living and working area (5) from an airlock or protective sluice (11).

1 **12.** The apparatus of claim 1, wherein said backpack (3)
2 comprises a separate hinge (H') for tilting or flapping
3 said backpack (3) with said decontamination chamber (7)
4 laterally away from said bulkhead (5') either in unison
5 with or separately from said decontamination chamber (7).

1 **13.** The apparatus of claim 1, wherein said decontamination
2 chamber (7) forms a door for said hole (5A) in said
3 bulkhead (5').

1 **14.** A method of entering a spacesuit by an astronaut, said
2 method comprising the following steps:

- 3 a) using an apparatus as defined in claim 1,
- 4 b) entering said spacesuit through said opening in said
5 back portion of said spacesuit,
- 6 c) hermetically sealing said decontamination chamber (7)
7 to said bulkhead (5') by closing said fourth sealing
8 and interlocking subsystem (12),
- 9 d) hermetically sealing said backpack (3) to said back
10 portion of said spacesuit (1) by closing said second
11 sealing and interlocking subsystem (6),
- 12 e) pressurizing said decontamination chamber (7, 7') to
13 a pressure level corresponding to an external pressure
14 level,
- 15 f) releasing said backpack (3) from said decontamination
16 chamber (7, 7') by opening said third sealing and
17 locking subsystem (9),
- 18 g) unlocking said first sealing and interlocking
19 subsystem (4), and
- 20 h) releasing said spacesuit from said bulkhead (5').